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Exchange-induced magnetic dipole mechanism of magnon sideband

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Abstract

We propose a new mechanism of exciton-magnon absorption in the 1D Heisenberg antiferromagnet KCuF3. It yields the correct description of the relative intensity of the spectral lines in both polarizations E⊥ c and E∥c. The magnon density of states has been calculated. The origin of the fine sideband structure in KCuF3 can be explained. The sharp magnon lines, observed in Ref. [1], correspond to the low energy singularities in the magnon density of states.

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Keywords

1D antiferromagnet, Magnon sideband, Optical transition